

Chapter 6

Monitor Utility

The monitor utility displays helpful information concerning the configuration and operation of the Cobra.

Connecting to a Monitor

Use the supplied serial cable to attach a monitor to the Cobra's serial port at J6. The following illustration points out the location and pinout of the serial port on the CDI-4240.

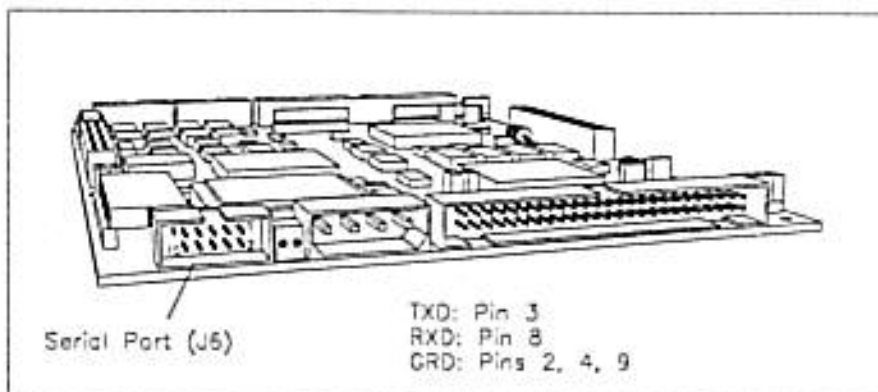
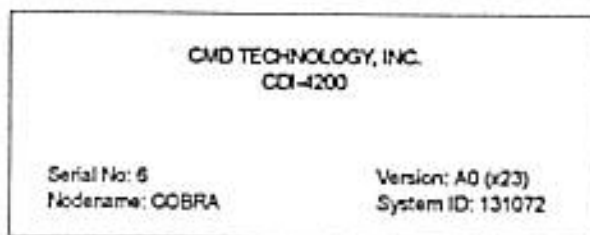


Fig. 6-1: Serial port location

Set your terminal's communications parameters to 9600 baud, 8-bit data, 1-stop bit, no parity, jump scroll.

Accessing the Monitor Utility

If you have the monitor connected at power up, you will see a series of boot up messages appear on the screen as the Cobra initializes its operating code. At the conclusion of this procedure, the monitor utility will display a message box containing the serial number, SCS nodename, SCS system ID and firmware version number of your Cobra.



press any key to continue

The main menu will appear as soon as you press a key.

```
CMD TECHNOLOGY, INC.  
CDI-4200  
MAIN MENU
```

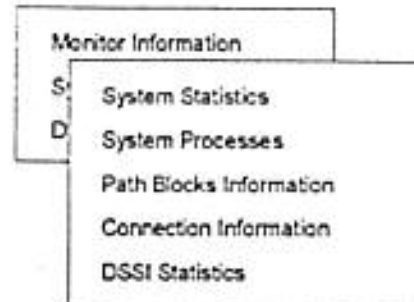
A rectangular box containing the following text:

```
Monitor Information  
System Parameters  
DUP Programs
```

The opening menu presents you with three options: Monitor Information, System Parameters and DUP Programs. Use the cursor keys to highlight an option and press ENTER to select it. You may press Ctrl-Z at any time to exit a screen and move up to the previous level in the menu tree. You may exit the monitor utility altogether by pressing Ctrl-Z at the main menu.

The DUP Programs menu option is explained in chapters 7, 8 and 9. System Parameters takes you immediately to the System Parameters screen, which presents a read-only display of the Cobra's configuration parameters. For a full explanation of this screen, see page 6-7. If you select Monitor Information, the utility will display a secondary menu with five choices as illustrated in the following screen recreation.

CMD TECHNOLOGY, INC.
CDI-4200
MAIN MENU



System Statistics

System Statistics provides an inventory of all the target devices and hosts connected to the Cobra. For DSSI buses, the screen displays which nodenames are located on which node IDs. For SCSI buses, the screen shows the ID of the Cobra on each bus, as well as the status of all target devices. In addition, the screen provides a continuously updated snapshot of system performance.

Uptime: 0 DAYS 00:14:56

SYSTEM STATISTICS
Version L1X3

01-SEP-1993 12:30:38

Cache hit: 100%
Req/Sec: 1300
Cache Size: 8MB

Free Lists

DB	USED/TTL
CORP	8/1024
SCORP	1/1024
COT	6/128
UCB	11/384
PB	3/32
SUCB	11/384
TCE	13/100
EMPSG	2/107
CAT	0/0
SGTORD	0/7
CBFRE	
SGWRLH	

Device Table		LUN/ID
PORT 0	PORT 1	
0 1 2 3 4 5 6 7	DSSI	
0 0	0*CCBRA	
1 A	1	
2 F	2	
3 C	3	
4	4	
5	5	
6	6	
7 COBRA	7 BLUE	
PORT 2	PORT 3	
0 1 2 3 4 5 6 7	0 1 2 3 4 5 6 7	
0 0	0 0	
1 A	1 A	
2 F	2 F	
3 C	3 C	
4	4	
5	5	
6	6	
7 COBRA	7 CCBRA	

The preceding screen simulation shows a typical System Statistics display for a cluster with one host (nodename Blue) connected to port 1 of the CDI-4240 by DSSI; and four devices connected to each SCSI bus on ports 0 through 3. Cobra is the nodename of the CDI-4240.

Each port section is in the form of an array. When the Cobra detects a device on a bus, it displays a code representing the status of the device (see the following table for code definitions). The position of the code indicates the SCSI ID and LUN of the device. The vertical axis of the array represents the SCSI ID, and the horizontal axis represents the LUN. In the simulated screen show above, each SCSI port has an "on-

line" device on ID 0, LUN 0, an "available" device on ID 1, LUN 0, an "offline" device on ID2, LUN 0, and a "cached" device on ID3, LUN 0.

■ Table 6-1 Device Table Port Codes

Code	Meaning	Explanation
O	Online	The device is working properly and has been mounted or initialized.
A	Available	The device is working properly but has not yet been mounted or initialized.
C	Cached	Data from the device is cached, using the Cobra's on-board cache.
F	Offline	The device has been detected on the bus but for some reason (e.g. not spun up) is not available for mounting or initializing.
M	Maintenance	The device has been selected for maintenance through the Diagnostics Utility Protocol (DUP) and is not available for I/O operations with the host.
<i>node name</i>	Initiator ID	The node name of the Cobra will appear next to its SCSI ID.

In the simulated System Statistics screen shown above, port 1 is dedicated to DSSI. The display for port 1, therefore, shows which systems or devices (identified by nodename) are assigned to the eight possible DSSI nodes.

The top, left corner of the screen contains information about the performance of the Cobra. The "cache hit" value indicates the percentage of read requests that have been satisfied from the Cobra's cache rather than from slower device accesses. The "Req/Sec" (requests per second) value gauges the rate at which the Cobra is handling I/O requests. "Cache Size" indicates how many megabytes of cache memory are installed on the board.

The "Free Lists" section shows how the Cobra's buffers are allocated and used. This information is intended for use by CMD technical support personnel as a troubleshooting tool. You may be asked to provide this information when you call CMD for technical support.

DSSI Statistics

This screen is intended as a tool for troubleshooting DSSI problems—particularly cabling and termination issues. Although the information on this screen is technical and designed primarily for service personnel, you may be able to use the screen to identify potential problems with your DSSI interface.

Port: 5

DSSI STATISTICS
30-MAR-1994 09:39:35

No CDRP Count
No Buffers Count
Bus resets detected
Bus resets initiated
Interface Fault Count

1
0
5155
0
6

	Node 4	Node 5	Node 6	Node 7
TX ok	0	0	0	2841258
TX incomplete	0	0	0	1471
TX retry	0	0	0	1549
Nak count	0	0	0	77
RX ok	0	0	0	1444516
RX fail	0	0	0	0
RX bad source id	0	0	0	0
RX bad dest id	0	0	0	0
RX bad header	0	0	0	0
RX no CDRP	0	0	0	0
RX no SGTD	0	0	0	0

N: NEXT SCREEN P: PREV SCREEN CTRL-Z: EXIT

If you notice abnormal values on the DSSI Statistics screen, try the following steps before calling technical support

- ☐ Check the DSSI cable for defects, such as a bad wire or a bad solder connection. If possible try swapping the cable with another cable that you believe to be in good condition.
- ☐ Check termination on the DSSI bus. The bus should be terminated at both ends. If the Cobra is at one end of the bus, make sure the DSSI terminator resistor packs are installed properly and the appropriate jumpers are set.

The CDI-4240 supports up to two DSSI ports, so there can be as many as two sets of DSSI statistics, one for each port configured for DSSI. Since the CDI-4220 supports only one DSSI port, the DSSI Statistics screen will display a single set of statistics. Each set of DSSI statistics contains two pages. The first page shows statistics for nodes 0 through 3 and the second page shows statistics for nodes 4 through 7. Use the N and P keys on the monitor keyboard to navigate among the screens. Press Ctrl-Z to exit the DSSI Statistics screen and C to reset all counters to zero.

Press "C" on your monitor keyboard to clear the DSSI Statistics screen and reset all counters to zero.

The following fields are displayed on the DSSI Statistics screen

No CDRP Count: CDRP, which stands for Class Driver Request Packet, is a buffer the Cobra uses to store packet header information. The number displayed in this field is a tally of the instances when the DSSI driver needed a CDRP but no CDRP was available. This number will equal the total of the "RX no CDRP" fields for all nodes.

No Buffers Count: The buffers referenced in this field are used by the Cobra to store the data portion of a packet. This value will increment each time the DSSI driver attempted to perform a write but could not perform the operation due to a lack of buffer space.

Bus Resets Detected: This field increments each time the Cobra detects a DSSI bus reset. Occasional resets are normal on DSSI. However,

if you see this counter incrementing at a rapid rate (e.g. once a second or more) you probably have a cabling problem.

Bus Resets Initiated: This field displays the number of times the Cobra initiated a bus reset on the DSSI. The Cobra will initiate a bus reset when it detects a parity error. A high number of bus resets initiated could indicate a cable or interface problem.

Interface Fault Count: This field counts the number of times a fault occurs in the DSSI interface chip. Such faults usually occur as a result of a physical cable break in a DSSI connection.

TX ok: The number of packets transmitted successfully.

TX incomplete: The number of packet transmissions that were attempted but failed because the host went bus free before the entire packet could be sent. A high number of TX incompletes could indicate a cabling problem.

TX retry: A count of the number of transmissions retried after an initial failure.

Nak count: The number of negative acknowledgments (Naks) received from the host. A host will issue a Nak when it has no buffer space to receive a packet from a node.

RX ok: The number of packets received successfully from a host.

RX fail: The number of failed transmissions that hosts attempted to send to the Cobra. A failed transmission is usually caused by a bad cable.

RX bad source id: The number of packets rejected by the Cobra due to a problem with the source ID in the header.

RX bad dest id: The number of packets rejected by the Cobra due to a problem with the destination ID in the header.

RX bad header: The number of packets rejected by the Cobra due to a packet header problem other than a bad source or destination ID.

RX no CDRP: The number of packets rejected by the Cobra due to a lack of CDRP buffer space for the packet header. The "RX no CDRP" field reports the same type of problem as the "No CDRP Count" field at the top of the screen, except it reports the total for a single node rather than an aggregate for all nodes.

RX no SGTD: The number of packets rejected by the Cobra due to a lack of SGTD (Scatter-Gather Table Descriptor) buffer space for the packet data. The "RX no SGTD" field reports the same type of problem as the "No Buffers Count" field at the top of the screen, except it reports the total for a single node rather than an aggregate for all nodes.

System Processes

This screen is intended as a troubleshooting tool for CMD Technical Support personnel. You may be asked to convey information from this screen if you call for assistance.

Path Blocks Information

This screen is intended as a troubleshooting tool for CMD Technical Support personnel. You may be asked to convey information from this screen if you call for assistance.

Connection Information

This screen is intended as a troubleshooting tool for CMD Technical Support personnel. You may be asked to convey information from this screen if you call for assistance.

System Parameters

This menu option takes you to a succession of read-only screens that display the current parameters for the every port and device. You may change these parameters with the DUP PARAMS program (see chapters 7 and 8) or with the front panel utility (see chapter 5).

The first screen that appears shows the current values for all system parameters. All identifying information, such as "Nodename," "System ID," SCSI and DSSI node IDs apply to the Cobra.

CFG Version 1.1		SYSTEM PARAMETERS		01-DEC-1993 10:56:13	
Port 0 Port Type: SCSI Node ID: 7 PCN Reset: ON Scan Type: DENSE Scan Rate: 60		Port 1 Port Type: DSSI Node ID: 0 PCN Reset: Scan Type: Scan Rate:		Comment: GEN0 from NOVRAM DateTime: Nodename: CCBRA System ID: 131072 Max Hosts: 16 Max Cached Units: 8 Disk Alloc Class: 4 Tape Alloc Class: 0	
Port 2 Port Type: SCSI Node ID: 7 PCN Reset: ON Scan Type: DENSE Scan Rate: 60		Port 3 Port Type: SCSI Node ID: 7 PCN Reset: ON Scan Type: DENSE Scan Rate: 60			

N: NEXT SCREEN	D: DISK CHAR INFO	T: TAPE CHAR INFO	CTRL-Z: EXIT
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Disk Device Parameters

The additional screens in the Systems Parameters menu option give a port-by-port listing of the local parameters for each ID and LUN. There are two screens for each port—one screen for disk devices and one screen for tape devices. You may cycle through all the screens by pressing "N" or jump to either the disk or tape screens by pressing the "D" or "T" key. A typical disk screen might look like the following example.

PORT 0 DISK				SYSTEM PARAMETERS												01-CEC-1993 10:55:13											
ID	Flags	Sync	Unit	Flags	Sync	Unit	Flags	Sync	Unit	Flags	Sync	Unit	Flags	Sync	Unit												
LUN 0				LUN 1				LUN 2				LUN 3															
0	DSMCUT	10	0	DSMCUT	10	1	DSMCUT	10	2	DSMCUT	10	3	DSMCUT	10	3												
1	DSMCUT	10	10	DSMCUT	10	11	DSMCUT	10	12	DSMCUT	10	13	DSMCUT	10	13												
2	DSMCUT	10	20	DSMCUT	10	21	DSMCUT	10	22	DSMCUT	10	23	DSMCUT	10	23												
3	DSMCUT	10	30	DSMCUT	10	31	DSMCUT	10	32	DSMCUT	10	33	DSMCUT	10	33												
4	DSMCUT	10	40	DSMCUT	10	41	DSMCUT	10	42	DSMCUT	10	43	DSMCUT	10	43												
5	DSMCUT	10	50	DSMCUT	10	51	DSMCUT	10	52	DSMCUT	10	53	DSMCUT	10	53												
6	DSMCUT	10	60	DSMCUT	10	61	DSMCUT	10	62	DSMCUT	10	63	DSMCUT	10	63												
7	DSMCUT	10	70	DSMCUT	10	71	DSMCUT	10	72	DSMCUT	10	73	DSMCUT	10	73												
LUN 4				LUN 5				LUN 6				LUN 7															
0	DSMCUT	10	4	DSMCUT	10	5	DSMCUT	10	6	DSMCUT	10	7	DSMCUT	10	7												
1	DSMCUT	10	14	DSMCUT	10	15	DSMCUT	10	16	DSMCUT	10	17	DSMCUT	10	17												
2	DSMCUT	10	24	DSMCUT	10	25	DSMCUT	10	26	DSMCUT	10	27	DSMCUT	10	27												
3	DSMCUT	10	34	DSMCUT	10	35	DSMCUT	10	36	DSMCUT	10	37	DSMCUT	10	37												
4	DSMCUT	10	44	DSMCUT	10	45	DSMCUT	10	46	DSMCUT	10	47	DSMCUT	10	47												
5	DSMCUT	10	54	DSMCUT	10	55	DSMCUT	10	56	DSMCUT	10	57	DSMCUT	10	57												
6	DSMCUT	10	64	DSMCUT	10	65	DSMCUT	10	66	DSMCUT	10	67	DSMCUT	10	67												
7	DSMCUT	10	74	DSMCUT	10	75	DSMCUT	10	76	DSMCUT	10	77	DSMCUT	10	77												

D: DISCONNECT | S: SPIN DOWN | M: IMMEDIATE | C: CACHE | U: DUT/DI DEVICE TYPE

N: NEXT SCREEN | P: PREV SCREEN | T: TAPE CHAR INFO | CTRL-Z: FIRST SCREEN

This screen shows the disk parameters for every possible ID and LUN on Port 0. The four boxes on the top row represent LUNs 0 through 3, from left to right. The bottom four boxes represent LUNs 4 through 7. Each row of values represents a SCSI ID, starting with ID 0 in the first row. The "Flags" column indicates how the disconnect (D), spndwn (S), immed (M), cache (C) and device_type (U) and tag queuing (T) parameters are set. A legend for the Flags column is at the bottom of the screen. The "Sync" column corresponds to the sync_rate parameter which sets the maximum sync rate (in megabytes per second) for each ID and LUN. The third column in each box shows the MSCP unit number assigned to that ID and LUN. (Please see page 8-7 for an explanation of these parameters.)

In the sample screen shown above, all the IDs and LUNs are set to their default disk parameter values. For instance, a disk device on SCSI ID 5, LUN 0 of Port 0 will have a MSCP unit number of 50. The device has a maximum sync rate of 10. The TYPE parameter is set to DU, and the DISC, SPIN, IMMD and CACH parameters are all enabled.

To view the parameter values for the next port, press the "N" key. You may reverse direction and view the previous screen at any time by pressing the "P" key. If you wish to jump directly to the first tape devices screen, press the "T" key.

Tape Devices Screen

The System Parameters screen for tape devices is similar to the disk devices screen, except that parameters unique to tapes are substituted for the SPIN, IMMD and CACH parameters for disk devices. A typical screen might look as follows.

PORT 0 TAPE				SYSTEM PARAMETERS									01-DEC-1993 10:56:13		
ID	Flags	Sync	Unit	Flags	Sync	Unit	Flags	Sync	Unit	Flags	Sync	Unit			
LUN 0				1			2			3					
0	DUT	0	100	DUT	0	101	DUT	0	102	DUT	0	103			
1	DUT	0	110	DUT	0	111	DUT	0	112	DUT	0	113			
2	DUT	0	120	DUT	0	121	DUT	0	122	DUT	0	123			
3	DUT	0	130	DUT	0	131	DUT	0	132	DUT	0	133			
4	DUT	0	140	DUT	0	141	DUT	0	142	DUT	0	143			
5	DUT	0	150	DUT	0	151	DUT	0	152	DUT	0	153			
6	DUT	0	160	DUT	0	161	DUT	0	162	DUT	0	163			
7	DUT	0	170	DUT	0	171	DUT	0	172	DUT	0	173			
LUN 4				5			6			7					
0	DUT	0	104	DUT	0	105	DUT	0	106	DUT	0	107			
1	DUT	0	114	DUT	0	115	DUT	0	116	DUT	0	117			
2	DUT	0	124	DUT	0	125	DUT	0	126	DUT	0	127			
3	DUT	0	134	DUT	0	135	DUT	0	136	DUT	0	137			
4	DUT	0	144	DUT	0	145	DUT	0	146	DUT	0	147			
5	DUT	0	154	DUT	0	155	DUT	0	156	DUT	0	157			
6	DUT	0	164	DUT	0	165	DUT	0	166	DUT	0	167			
7	DUT	0	174	DUT	0	175	DUT	0	176	DUT	0	177			

D: DISCONNECT	E: EXABYTE SHORT	F: FAST T MARK SEARCH	U: MU DEVICE TYPE
N: NEXT SCREEN	P: PREV SCREEN	D: DISK CHAR INFO	CTRL-Z: FIRST SCREEN

Like the disk devices screen, the parameter values for each LUN are displayed in boxes, from LUN 0 in the top, left box to LUN 7 in the bottom, right box. SCSI IDs are listed from 0 at the top of each box to 7 at the bottom. The first column in each LUN box lists the values for the DISC (D), SHTM (E), FTMS (F) and TYPE (U) parameters. The second column shows the value of the SYNC parameter for each ID and LUN. The third column shows the MSCP unit number assigned to that ID and LUN. A legend for the "flags" column appears at the bottom of the screen.

Chapter 7

DUP Programs

Accessing DUP

There are two ways to access the Cobra's diagnostics utility protocol (DUP) programs:

- From the console or OpenVMS prompt
- From a monitor connected to the Cobra's serial interface

This chapter contains instructions on how to access DUP programs via these two methods. For information about the PARAMS and UTILIT programs, see chapters 8 and 9.

In addition, you may modify the Cobra's operational parameters from the front panel. See chapter 5 for more information about this feature.

CMD recommends against using two methods for changing parameters at the same time. You will get unexpected results if, for example, you try to change parameters on the front panel and from DUP at the same time.

From the VAX Console

Follow these steps to access DUP from the console prompt on OpenVMS VAX systems.

- 1 Enter the SHOW DEVICE command at the console prompt.

```
>>> SHOW DEVICE

DSSI Node 0 (nodename)
-DUA200 (RF72)
-DUA210 (RF72)
-DUA250 (RF72)

DSSI NODE ID 5 (*)

UQSSP Disk Controller 0 (772150)
-DUA0 (RAB2)

Ethernet Adapter
-ESA0 (08-00-2B-13-80-85)
```

In the above example, the Cobra adapter is on DSSI node ID 0. If you have assigned a nodename to the adapter, it will show up in parentheses in place of *nodename*, otherwise *nodename* will be a six digit number.

- 2 Now that you know the Cobra's DSSI node ID, you can establish a connection to the adapter's DUP server by entering one of two commands. The configuration of your system will determine which command is appropriate. Use the following command if your system has just one DSSI bus.

```
>>> SET HOST/DUP/DSSI a
Starting DUP server
Copyright (C) 1994 CMD Technology, Inc.
  CDI-4200  Serial No: 0
  Firmware Rev. A0
DIRECT V1.0 D 08-17-93 11:50:00
PARAMS V1.0 D 08-17-93 10:50:01
UTILIT V1.0 D 08-17-93 10:50:02
End of Directory
Task Name?
```

Replace the variable *a* in the command line with the DSSI node ID of the Cobra. At the "Task Name?" prompt, enter either "PARAMS" or "UTILIT," depending on which program you want to enter.

See chapter 8 for a description of the PARAMS program and chapter 9 for a description of the UTILIT program.

If your system has two DSSI buses, you must include the bus on which the Cobra resides in your command statement.

```
>>> SET HOST/DUP/DSSI/BUS: n a
Starting DUP server
Copyright (C) 1994 CMD Technology, Inc.
  CDI-4200  Serial No: 0
  Firmware Rev. A0
DIRECT V1.0 D 08-17-93 11:50:00
PARAMS V1.0 D 08-17-93 10:50:01
UTILIT V1.0 D 08-17-93 10:50:02
End of Directory
Task Name?
```

Replace the variable *n* in the command statement with the bus number (0 or 1) and the variable *a* with the DSSI node ID of the Cobra. At the "Task Name?" prompt, enter either "PARAMS" or "UTILIT," depending on which program you want to enter. If you do not receive a "Task Name?" prompt, you have not established a link with the Cobra's DUP server. Check to make sure that you entered the proper command in step 2 and that you are entering the correct DSSI node ID for the Cobra.

See chapter 8 for a description of the PARAMS program and chapter 9 for a description of the UTILIT program.

From the AXP Console

Follow these steps to access DUP from the console prompt on OpenVMS AXP systems.

- 1 Enter the command SHOW CONFIG from the console prompt.

```
>>> SHOW CONFIGURATION
```

```
Console V2.8-9900
```

```
CPU0      P  B2001-BA DECchip (TM) 21064-3
```

```
CPU1      -
```

```
Memory 0  -
```

```
Memory 1  -
```

```
Memory 2  -
```

```
Memory 3  P  B2002-DA 128 MB
```

```
Ethernet 0 P  08-00-2B-32-E6-AB
```

```
Ethernet 1 P  08-00-2B-32-E6-AB
```

			ID 0	ID 1	ID 2	ID 3	ID 4	ID 5	ID 6	ID 7
A	SCSI	P	RZ73							Host
B		P	RZ73							Host
C		P		RZ73			RF72			Host
D		P					RF73			Host
E		P	TZ85	RRD42						Host
Futurebus+		P					FB00			Host

```
System Status Pass      Type b to boot ducl.1.0.2.0
```

The result is a map of all devices on the system and their DSSI/SCSI bus addresses. In the above example the Cobra shows up as RF72 on bus C, DSSI node ID 4. You will use this information in the next step.

- 2 Connect to the Cobra's DUP server by entering the following command.

```
>>> SET HOST -DUP d
```

Replace the variable *d* with the port address of the Cobra. For the system configuration mapped in step 1, the correct command would be as follows.

```
>>> SET HOST -DUP PUC0.4.0.2.0
```

```
Starting DUP server
```

```
Copyright (C) 1994 CMD Technology, Inc.
```

```
COI-4200 Serial No: 0
```

```
Firmware Rev. A0
```

```
DIRECT V1.0 D 08-17-93 11:50:00
```

```
PARAMS V1.0 D 08-17-93 10:50:01
```

```
UTILIT V1.0 D 08-17-93 10:50:02
```

```
End of Directory
```

```
Task Name?
```

The port address should conform to the following format.

PU	C	0.	4.	0.	2.	0
Bus Number: Always 0 for the Cobra						
Slot Number: Corresponds to the storage adapter letter, with A having slot number 0, B having slot number 1 and so on.						
Channel Number: Used for multi-channel devices. Does not apply to the Cobra.						
Bus Node Number: The DSSI node ID or SCSI ID of the device.						
Device Unit Number: The unique MSCP unit number of the device.						
Storage Adapter ID: The one-letter storage adapter designator (A, B, C, D or E)						
Driver ID: the two-letter port or class driver designator (PU for a DSSI port).						

- At the "Task Name?" prompt, enter either "PARAMS" or "UTILIT," depending on which program you want to enter. If you do not receive a "Task Name?" prompt, you have not established a link with the Cobra's DUP server. Check to make sure that you entered the proper command in step 2.

See chapter 8 for a description of the PARAMS program and chapter 9 for a description of the UTILIT program.

OpenVMS Prompt

Follow these steps to connect to DUP from the OpenVMS Prompt...

- If you are working on a terminal connected to a VAX system, issue the following command to connect to the DUP server:

```
$ MC SYSGEN CONNECT DUP_server/NOADAPTER
```

Replace the variable *DUP_server* with the name of the DUP server on your system. This is typically "FYA0."

- If you are working on a terminal connected to an AXP system, issue the following command to connect to the DUP server:

```
$ MC SYSMAN IO CONNECT DUP_server/NOADAPTER/DRIVER=SYS$FYDRIVER
```

Replace the variable *DUP_server* with the name of the DUP server on your system. This is typically "FYA0."

- Once you have connected to the system DUP server, you can access the Cobra's DUP programs by issuing the following command:

```
$ SET HOST/DUP/TASK=taskname/SERVER=MSCP$DUP n
```

Replace the variable *taskname* with either "PARAMS" or "UTILIT," depending on which program you want to enter. You may also omit the TASK=*taskname* parameter, in which case you will be prompted to enter a task name. Replace the variable *n* at the end of the command line with the nodename of the Cobra.

See chapter 8 for a description of the PARAMS program and chapter 9 for a description of the UTILIT program.

Serial Interface

This section assumes that you have already established a connection with the Cobra's serial interface. If you have not, see chapter 6 for instructions.

Follow these steps to connect to DUP from the serial interface...

- 1 Select "DUP Programs" from the main menu.
- 2 At the "Task Name?" prompt, enter the DUP program you want to enter—either PARAMS or UTILIT.

See chapter 8 for a description of the PARAMS program and chapter 9 for a description of the UTILIT program.

Chapter 8

PARAMS

Overview

The DUP program PARAMS provides a means to modify the Cobra's operational parameters. These parameters are divided into three groups: system parameters, port parameters and device parameters. System parameters include the DSSI node name and system ID of the Cobra, as well as the allocation class for the disk and tape devices controlled by the Cobra. Port parameters control how the Cobra scans its SCSI buses to look for devices. And device parameters set such device-level attributes as the unit number of each device, whether a device is online or offline to the host and whether data from a device is to be cached by the Cobra. The remainder of this chapter provides a complete list of system, port and device parameters and instructions on how to modify them.

PARAMS Commands

The following commands are available in PARAMS...

You may abbreviate any PARAMS command, as long as all keywords are unambiguous. For example, you may enter "SH DEV" or even "SH D" instead of "SHOW DEVICE." However, you will receive an error message if you enter "S D," because "S" could refer to either "SET" or "SHOW."

HELP

Enter this command to view a brief summary of PARAMS commands and their proper syntax.

SET SYSTEM

Use this command to set the following system parameters: SYSTEM_ID, NODENAME, DISK_ALCS, TAPE_ALCS, MAX_HOSTS and MAX_CACHED_UNITS. See "System Parameters" starting on page 8-4 for definitions and descriptions of these parameters. The syntax of the SET SYSTEM command is as follows:

SET SYSTEM parameter=<value> [...]

...where parameter is the keyword of the parameter you wish to change, and <value> is the new value for the parameter. [...] indicates that more than one command may be entered on a single line.

The following are examples of the SET SYSTEM command...

```
SET SYSTEM NODENAME=COBRA
SET SYSTEM MAX_HOSTS=14
SET SYSTEM DISK_ALCS=4 TAPE_ALCS=4
```

SET PORT

Use this command to set the following port parameters: SCANNING, SCAN_RATE and POWER_ON_RESET. See "Port Parameters" starting on page 8-6 for definitions and descriptions of these parameters. The syntax of the SET PORT command is as follows:

```
SET PORT <p> parameter=<value> [...]
```

...where <p> is the port number, parameter is the keyword of the parameter you wish to change, and <value> is the new value for the parameter. You may use an asterisk (*) in place of <p> if you wish to change the same parameter for all ports. [...] indicates that more than one command may be entered on a single line.

The following are examples of the SET PORT command...

```
SET PORT 1 SCANNING=DENSE
SET PORT 0 POWER_ON_RESET=ON SCANNING=NONE
SET PORT * SCAN_RATE=80
```

SET DEVICE

Use this command to set the following device parameters: ONEB, CACH, TYPE, DISC, FTMS, IMMD, UNIT, SHTM, SPIN, SYNC, TAGQ, WPRT, TRNC, ADD and SUBTRACT. See "Device Parameters" starting on page 8-7 for definitions and descriptions of these parameters. The syntax of the SET DEVICE command is as follows:

```
SET DEVICE <p> <i>parameter=<value> [...]
```

...where <p> is the port number, <i> is the SCSI ID of the device, parameter is the keyword of the parameter you wish to change, and <value> is the new value for the parameter. [...] indicates that more than one command may be entered on a single line. You may use an asterisk (*) in place of <p> and/or <i> if you wish to change the same parameter for all ports and/or all SCSI IDs.

The following are examples of the SET DEVICE command...

```
SET DEVICE 1 2 ONEB=OFF
SET DEVICE 2 4 TAGQ=ON WPRT=OFF
SET DEVICE * * CACH=ON SYNC=8
SET DEVICE 3 * ADD=1000
```


SHOW ALL

Issue this command to view a listing of all SYSTEM, PORT and DEVICE parameters.

SHOW DEVICE

This command displays a listing of all DEVICE parameters for every port and SCSI ID.

SHOW SYSTEM

This command displays a listing of all SYSTEM parameters.

WRITE

When you use the SET SYSTEM, SET PORT or SET DEVICE command to change a parameter value, you are actually editing a duplicate of the current configuration record, which contains the parameters that control the Cobra. The changes you make to the duplicate do not become part of the current configuration record until you WRITE the duplicate to the Cobra's nonvolatile random access memory (NOVRAM) and re-initialize the Cobra by issuing the RESTART command or by recycling power.

The WRITE command takes no arguments. Be sure to follow up the WRITE command with RESTART to initialize your changes.

FACTORY

The FACTORY command restores all parameters in the duplicate configuration record to their factory default values. To make the factory defaults the current operating parameters, you must perform the WRITE/RESTART procedure.

The FACTORY command takes no arguments. To issue the command, type FACTORY by itself on the command line.

REFRESH

The REFRESH command erases any parameter changes (except changes made to ONEB, CACH and WPRT, which take effect immediately) and creates a new duplicate copy of the current configuration record. Use this command when you have second thoughts about a series of changes and want to start over again from a clean slate.

If you can also use this command to take back a WRITE. If you wish to restore the Cobra's NOVRAM to its state before the WRITE, issue the REFRESH command, followed by another WRITE command. This will restore the old NOVRAM values. This procedure will not work if you RESTART the controller after the initial WRITE.

Three DEVICE parameters take effect immediately after you use the SET DEVICE command to change them. These parameters are ONEB (online enable), CACH (cache) and WPRT (write protect). As soon as you set these parameters, their new values become part of the current configuration record, without the need for the WRITE/RESTART procedure.

The REFRESH command takes no arguments. To issue the command, type REFRESH by itself on the command line.

RESTART

Use the RESTART command to reinitialize the Cobra after you have changed parameters with the SET command and saved them to the NOVRAM with the WRITE command. You do not need to perform a RESTART when you change the ONEB, CACH or WPRT parameters. Changes to these parameters take effect immediately.

The RESTART command takes no arguments. To issue the command, type RESTART by itself on the command line.

QUIT

Exit a DUP PARAMS session with the QUIT command. This will take you back to the DUP directory. Exit DUP altogether by pressing Ctrl-C or the BREAK key. If you are accessing DUP through the Cobra's serial interface, press Ctrl-Z to return to the main menu.

System Parameters

System parameters configure the Cobra for a particular operating environment. The six system parameters recognized by the Cobra are listed below. Factory default settings are indicated with bold face type.

■ Table 8-1 System Parameters

Parameter	Valid Entries	
	DUP	Front Panel
SYSTEM_ID	1 to 268435456 (131072)	1 to 268435456 (131072)
NODENAME	≤8 characters (131072)	≤8 characters (131072)
DISK_ALCS	0 to 255 (4)	0 to 255 (4)
TAPE_ALCS	0 to 255 (4)	0 to 255 (4)
MAX_HOSTS	1 to 32	1 to 32
MAX_CACHED_UNITS	0 to 255 (8)	0 to 255 (8)

Descriptions

SYSTEM_ID: Specifies the lower-order 32 bits of the 48-bit system identification number. Each node in the system must have a unique system ID. The higher order 16 bits are reserved by Digital Equipment Corp. for future use.

NODENAME: Sets the DSSI node name of the Cobra. The name must be unique among all nodes in the system. You may enter a name that is up to eight characters long, but VMS will recognize only the first six characters. The node name may contain any alphanumeric character except the dollar sign (\$) or the underscore (_) character.

DISK_ALCS: Determines the device allocation class for all disk devices connected to the Cobra. If you wish to have the disks served to other nodes in the system, this parameter must be greater than zero and match the ALLOCLASS SYSGEN parameter on all connected systems.

TAPE_ALCS: Determines the device allocation class for all tape devices connected to the Cobra. If you wish to have the tape devices served to other nodes in the system, this parameter must be greater than zero and match the ALLOCLASS SYSGEN parameter on all connected systems.

MAX_HOSTS: Specifies the maximum number of hosts with which the Cobra will communicate. For best results, set this to the number of hosts in your system.

MAX_CACHED_UNITS: Specifies the maximum number of disk devices to be cached on the CDI-4204 cache board. You should set this parameter to the largest number of devices you expect to cache. This permits the Cobra to configure itself for maximum cache efficiency.

Port Parameters

Port parameters govern the Cobra's DSSI and SCSI ports. The four system parameters recognized by the Cobra are listed below. Factory default settings are indicated with bold face type.

■ Table 8-2 Port Parameters

Parameter	Valid Entries	
	DUP	Front Panel
SCSI_ID	0 to 7 (show only)	N/A
DSSI_ID	0 to 7 (show only)	N/A
SCANNING	Dense, Sparse , None	Dense, Sparse , None
SCAN_RATE	0 to 255 seconds (60)	0 to 255 seconds (60)
POWER_ON_RESET	On Off	Yes No

Descriptions

SCSI_ID: This parameter shows the SCSI ID of a particular Cobra port. You may view the value of this parameter on the front panel or through DUP, but you may not modify it. To change the SCSI ID for a port, you must manipulate the appropriate jumpers on the board.

DSSI_ID: This parameter shows the DSSI node ID of a particular Cobra port. You may view the value of this parameter on the front panel or through DUP, but you may not modify it. To change the DSSI node ID for a port, you must manipulate the appropriate jumpers on the board.

SCANNING: When set to "dense" or "sparse," this parameter will cause the Cobra to periodically scan all SCSI buses for new devices. Use "dense" when your devices are packed on each SCSI bus, with no vacant addresses between devices installed on the same bus. A "dense" scan will begin at SCSI ID 7, logical unit number (LUN) 0 and progress through each LUN until it finds a vacant address, at which point it begins searching LUN 0 of the next smaller ID. "Dense" scanning will not find a device if there is a vacant LUN between it and the preceding device on the same bus. Use "sparse" when your devices are scattered on the bus, with vacant addresses among them. A "sparse" scan will search every ID and LUN on each bus. The scanning frequency is determined by the *scan_rate* parameter. When scanning is set to "none," the Cobra will perform a single scan on each SCSI bus when power is turned on.

SCAN_RATE: When the scanning parameter is set to "sparse" or "dense," *scan_rate* determines how frequently (in seconds) scans take place.

POWER_ON_RESET: This parameter enables or disables the issuance of a SCSI bus RESET on power-up.

Device Parameters

Device parameters control how the Cobra treats each device connected to it. The 15 system parameters recognized by the Cobra are listed below. Factory default settings are indicated with bold face type.

■ Table 8-3 Device Parameters

Parameter	Valid Entries	
	DUP	Front Panel
Type	DU DI (disk); MU (tape)	DU DI (disk); MU (tape)
Unit	0 to 9999	0 to 9999
Oneb	On Off	ONLINE OFFLINE
Wprt	On Off	Yes No
Sync	0 to 10 MB/sec	Async to 10 MB/sec
Cach	On Off	On Off
Disc	On Off	Yes No
TagQ	On Off	Yes No
Spin	On Off	Yes No
Immd	On Off	Yes No
Shlm	On Off	Yes No
Fims	On Off	Yes No
Tmc	On Off	Yes No
Add	1 to 9999	N/A
Subtract	1 to 9999	N/A

Descriptions

Type: This parameter determines the default device type for disk and tape devices controlled by the Cobra. For disk devices, you have two choices: DU, the standard disk type for UDA disks, or DI, the disk type for DSSI disks. Neither device type carries any advantage over the other in terms of performance or serving ability.

Unit: This parameter permits you to specify a unit number for any particular device. The unit number is a component of the physical device name that VMS uses to address storage devices. By default, the Cobra assigns unit numbers according to the following formula: $(100 * \text{port}) + (10 * \text{id})$. For devices on LUNs, add the LUN to the base unit number for the LUN's port and SCSI ID. For example, the default unit number for a device on port 1, ID 5, LUN 3 would be 153. If you change the default unit number for any port-ID address, be sure that it does not conflict with another unit number.

Oncb: The *Oncb* (online enable) parameter makes a device online with respect to the host when set to "on" and offline when set to "off." Set this parameter to "off" when you want to block the transmission of commands from the host to a particular device. For normal operation, set *Oncb* to "on."

Wprt: *Wprt* enables or disables write protection on a device. Set *Wprt* to "on" to enable write protection and prevent a host from writing to a device. Set the parameter to "off" to disable write protection.

Sync: This parameter sets the maximum rate (in megabytes per second) at which the Cobra will attempt to transfer data in synchronous mode. If the Cobra cannot negotiate the maximum rate with the device, it will work its way down until it can agree on a lower rate. *Sync* must be a whole number between zero and 10. A sync rate of zero forces the Cobra to communicate with the device in asynchronous mode.

Cach: Use this parameter to set caching on or off for a device. When you set *Cach* "off" for a device, the Cobra will not cache data from that device. Turn *Cach* "on" when you want to store data from a device in the Cobra's read cache.

Disc: Set this parameter to "on" to enable disconnect for a device. Disconnect is a feature of SCSI that enables a target device to temporarily disconnect from the bus while it processes a command. When it completes its work, the device reconnects to the bus to transmit a response to the initiator. Disconnect can enhance performance by allowing other devices to access the bus while a device is performing lengthy operations, such as a tape rewinds or disk seeks. If you have only one device on a bus, you will get better performance by disabling disconnect (set *disc* to "off").

TagQ: This parameter enables or disables tag queuing. Tag queuing permits each initiator to issue commands with instructions for how the target should handle the command. An initiator can specify whether each command should be executed by the target at the first opportunity, in the order in which it was received, or at a time deemed appropriate by the target. Tag queuing permits each initiator to have multiple commands outstanding and each target to optimize the commands it receives.

Spin: Use this parameter to enable or disable spin down. When set to "on," the Cobra will spin down drives or eject media when the operating system issues a spin down command such as the VMS DISMOUNT/UNLOAD command.

Immd: When set to "on," this parameter sets the IMMEDIATE bit in the SCSI STOP and START commands. You should turn this parameter "off" if you have a Sony optical disk drive connected to the Cobra. When set to "off," the VMS prompt will not return until the drive's media is ejected or the drive has spun down.

Shtm: When set to "on," this parameter enables the writing of short filemarks on Exabyte devices. When disabled ("off") all filemarks will be written as long filemarks.

Ftms: When set to "on," this parameter enables high speed forward and reverse filemark searching. This mode can increase tape drive performance, but it should not be used when you intend to perform a VMS standalone backup.

Tmc: When this parameter is disabled ("off"), disks controlled by the Cobra will be compatible with other CMD Technology adapters. If you are not using other CMD adapters, turn truncation "on." This truncates the number of blocks to be divisible by 126 for faster VMS volume shadowing catch-up time.

Add: Use this parameter in conjunction with the wildcard character (*) to quickly add a specified value to the unit numbers of a group of devices. For instance, the following DUP command adds 1000 to the unit number of each drive on port 2.

```
SET DEVICE 2 * ADD=1000
```

If an addition would cause a unit number to exceed the maximum value of 9999, the calculation automatically resumes from 0. For example, if you add 1000 to a device with a unit number of 9100, the resulting unit number will be 100.

Subtract: This parameter is similar to *Add*, except it subtracts a specified value from the unit numbers of a group of devices. The following command subtracts 1000 from the unit numbers of all devices on port 1.

```
SET DEVICE 1 * SUBTRACT=1000
```

If a subtraction would cause a unit number to be less than the minimum value of 0, the calculation automatically resumes from 10000. For example, if you subtract 100 from a device with a unit number of 50, the resulting unit number will be 9950.

Please note that the Cobra does not perform consistency checking to verify that all devices under its control have unique device unit numbers. It is the user's responsibility to see that no two devices have the same unit number. This is particularly true in the case of the Add and Subtract commands, which easily can result in duplicate unit numbers if you are not careful.

Chapter 9

UTILIT

Accessing Device Utilities

The Cobra offers built-in utilities to format, qualify and test the devices they control. You may access these utilities by selecting the UTILIT task from the DUP utility.

UTILIT Commands

This section describes the commands available under UTILIT.

HELP Command

You may enter the HELP command to receive a listing of all available UTILIT commands and their syntax. This is an example of the output from the HELP command.

```
UTILIT> HELP

HELP
SHOW           [device_name] | [/ALL]
SELECT         device_name
DESELECT       device_name
ABORT          device_name

- Disk Commands -
FORMAT         device_name
QUALIFY        device_name [/WRITE]
DISKTEST       device_name [/WRITE]

- Tape Commands -
TAPETEST       device_name

UTILIT>
```


The variable *device_name* stands for any valid MSCP/TMSCP device label. Examples of disk drive device labels would be DIA100 and DUA120. Device labels for tape devices begin with MU, such as MUA240.

SHOW Command

The result of the SHOW command is a listing of information about the *device_name* or all devices if the /ALL qualifier is specified.

UTILIT> SHOW

Device	SID	Vendor	Model	Rev	Dev Stat	Maint Oper	Maint Status
DUA220	2-0	DEC	R228	435E	MAINT	IDLE	READY

UTILIT> SHOW /ALL

Device	SID	Vendor	Model	Rev	Dev Stat	Maint Oper	Maint Status
DUA210	1-0	DEC	R228	435E	MAINT	DISKTEST	IN PROGRESS
DUA220	2-0	DEC	R228	435E	MAINT	IDLE	READY
MUA240	4-0	DEC	TL26	0491	AVAILABLE		
MUA260	6-0	DEC	TL26	0491	MAINT	TAPETEST	IN PROGRESS

Table 9-1 describes the contents of each column in the SHOW output display.

■ Table 9-1 SHOW Command Output

Column	Description
Device	The MSCP or TMSCP device name
SID	The SCSI ID—LUN of the device
Vendor	The vendor's name, truncated to seven characters
Model	The device model name, truncated to seven characters
Rev	The manufacturer's revision code for the device firmware
Dev Stat	The current status of the device
Maint Oper	The UTILIT operation, if any, currently underway
Maint Status	The status of the current UTILIT operation

SELECT Command

Before you can perform a UTILIT operation on a device you must first SELECT it. The act of selecting a device changes its operational status to MAINT and renders it unavailable to the OpenVMS operating system.

Only devices listed as AVAILABLE by the SHOW command can be selected. Devices listed as OFFLINE or ONLINE cannot be selected.

The following example of the SELECT command begins with a SHOW command to illustrate the change that occurs to the "Dev Status" column.

SELECT Example

UTILIT> SHOW DUA220

Device	SID	Vendor	Model	Rev	Dev Stat	Maint	Oper	Maint	Status
DUA220	2-0	DEC	R22B	435E	AVAILABLE				

UTILIT> SELECT DUA220

Device	SID	Vendor	Model	Rev	Dev Stat	Maint	Oper	Maint	Status
DUA220	2-0	DEC	R22B	435E	MAINT				READY

DESELECT Command

The Deselect command returns a selected device to AVAILABLE status and allows the operating system to again access it.

DESELECT Example

UTILIT> SHOW DUA220

Device	SID	Vendor	Model	Rev	Dev Stat	Maint	Oper	Maint	Status
DUA220	2-0	DEC	R22B	435E	MAINT				READY

UTILIT> Deselect DUA220

Device	SID	Vendor	Model	Rev	Dev Stat	Maint	Oper	Maint	Status
DUA220	2-0	DEC	R22B	435E	AVAILABLE				

ABORT Command

The ABORT command terminates a QUALIFY, DISKTEST or TAPETEST operation. These operations normally run indefinitely or until stopped with the ABORT command or by shutting off power to the adapter.

ABORT Example

UTILIT> ABORT DUA220

UTILIT>

FORMAT Command

Use the FORMAT command to format a disk drive that has been selected with the SELECT command. Since the format operation will de-

stroy any data on the disk drive, you will be prompted to confirm that you wish to proceed. If you respond with "N" or "NO," the format will be aborted with no affect on your data. Enter "Y" or "YES" to proceed with the format. Once initiated, the format operation cannot be aborted with the ABORT command.

FORMAT does not produce any message when the operation is completed. You should periodically issue the SHOW command to check on the status of the format. It is a good practice to run one or more QUALIFY passes on the drive after a format.

FORMAT Example

```
UTILIT> FORMAT DUA220
```

Device	SID	Vendor	Model	Rev	Dev Stat	Maint	Oper	Maint	Status
DUA220	2-0	DEC	R22B	435E	MAINT		IDLE		READY

FORMAT will destroy all data on this device. Are you sure (Y/N)? YES

```
UTILIT>
```

QUALIFY Command

The QUALIFY command will verify the readability of the media in a disk drive. If you use the /WRITE qualifier, the command also detects and replaces bad blocks on the media. Use the QUALIFY command by itself when you want to verify the integrity of a disk drive that already contains data, since the operation only reads from the disk drive. Use the QUALIFY command with the /WRITE qualifier on newly formatted drives for a more thorough test of the drive's integrity.

The /WRITE qualifer causes QUALIFY to write 32-kilobyte data chunks to the drive and then read them back. QUALIFY verifies the entire disk, block by block. When it reaches the final block it returns to the first block and repeats the process. This continues indefinitely until you stop the operation by issuing the ABORT command or by turning off power to the adapter.

You must SELECT a device before performing a QUALIFY operation on it.

QUALIFY Example

```
UTILIT> QUALIFY DUA220
```

Device	SID	Vendor	Model	Rev	Dev Stat	Maint	Oper	Maint	Status
DUA220	2-0	DEC	R22B	435E	MAINT				READY

QUALIFY will destroy all data on this device. Are you sure (Y/N)? YES

```
UTILIT>
```


DISKTEST Command

The DISKTEST command exercises the selected drive and corrects any media errors. During a DISKTEST /WRITE operation, the Cobra writes to randomly selected logical blocks on the device and then reads and verifies the data. If the device you want to test already contains data, omit the /WRITE qualifier, and DISKTEST will simply read from randomly selected logical blocks. For newly formatted devices, you must use the /WRITE qualifier, or else DISKTEST will have no data to read.

You must SELECT a device before running DISKTEST on it.

If DISKTEST encounters an error that it cannot correct, it will display a message describing the error condition.

DISKTEST will run indefinitely until you issue the ABORT command or turn off power to the adapter.

DISKTEST Example

```
UTILIT> DISKTEST DUA220
```

Device	SID	Vendor	Model	Rev	Dev Stat	Maint Oper	Maint Status
DUA220	2-0	DEC	R228	435E	MAINT	IDLE	READY

```
DISKTEST will overwrite some or all data on this device. Are you sure (Y/N)? YES
```

```
UTILIT>
```

TAPETEST Command

TAPETEST exercises the selected tape device by writing, rewinding and reading each section of tape, up to but not including filemarks. The block size for the initial write is 32 kilobytes. This is halved on each successive write/rewind/read operation. The test restarts when the block size reaches 1 kilobyte. TAPETEST will replace any media errors it discovers.

You must SELECT a device before running TAPETEST on it. Be sure that the tape device contains enough tape for 10 megabytes of 1 kilobyte blocks, otherwise TAPETEST will not work.

TAPETEST will run indefinitely until you stop the operation with the ABORT command or by turning off power to the adapter.

If TAPETEST encounters an error that it cannot correct, it will display a message describing the error condition.

TAPETEST Example

UTILIT> TAPETEST MUA260

Device	SID	Vendor	Model	Rev	Dev Stat	Maint Open	Maint Status
MUA260	S-D	DEC	TL26	0491	MAINT	IDLE	READY

TAPETEST will overwrite some or all data on this device. Are you sure (Y/N)? YES
Initiating Tape Test

UTILIT>

Appendix A

Other Components

This appendix describes the front panel, power and serial interface connectors on the CDI-4220 and CDI-4240, as well as other miscellaneous components.

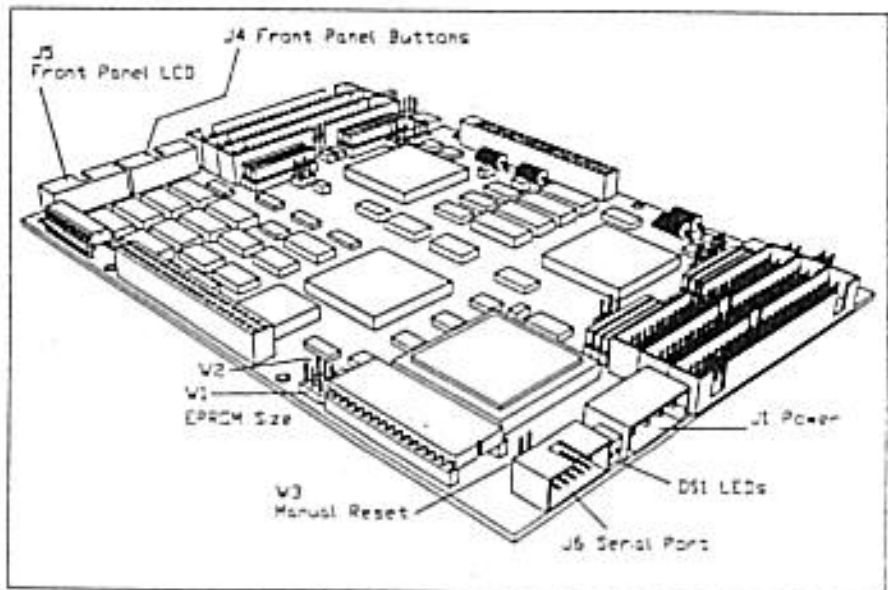


Fig. A-1: CDI-4240 other components

EPROM Size

Jumpers W1 and W2 specify the size of the EPROM on the CDI-4220 and the CDI-4240. These jumpers will be set properly when you receive your adapter, and you may never need to touch them. The only occasion that may call for you to change these jumpers is a firmware upgrade. If the EPROM containing the new firmware has a different capacity than your old EPROM, you must change jumpers W1 and W2 accordingly.

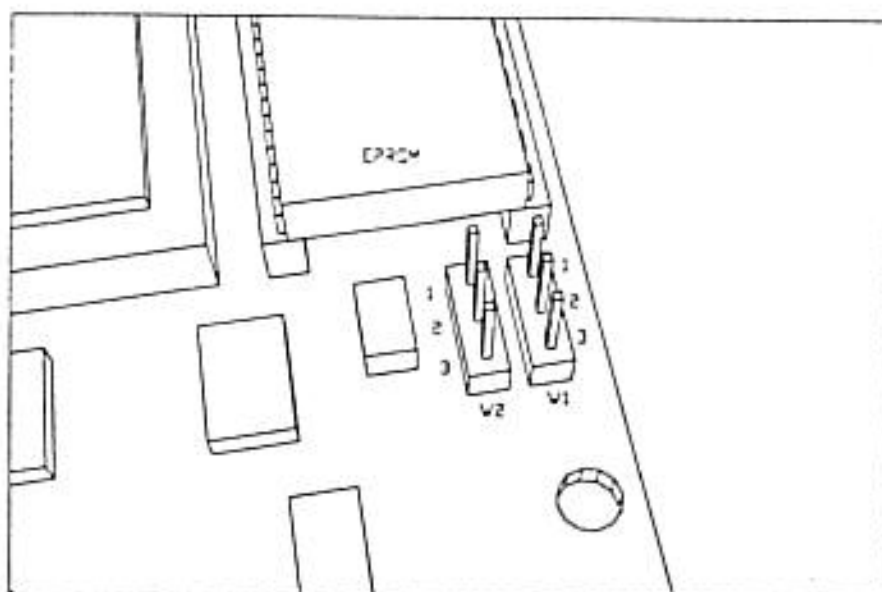


Fig. A-2: EPROM size selector (W1 & W2)

■ Table A-1 Jumpers W1 and W2 (EPROM Size)

EPROM Size	W1 (1-2)	W1 (2-3)	W2 (1-2)	W2 (2-3)
128Kb		IN		IN
256Kb		IN		IN
512Kb	IN			IN
1024Kb	IN		IN	

Front Panel Connectors

The cables from the front panel display attach to connectors J4 and J5, with the cable to the front panel buttons going to J4 and the LCD display cable going to J5.

Power Supply

The CDI-4220 and CDI-4240 receive power (5 volts, 1.5 amps) through connector J1.

Serial Interface

You may attach a monitor to the serial port at J6. The serial interface provides a means to view status screens and change adapter parameters.

LED Indicator

The LED indicator (DS1) provides visual confirmation of adapter operations and information about errors encountered.

Manual Reset

Jumper W3 provides a means other than recycling power to manually reset the adapter. To reset the adapter, short the two pins with a jumper shunt. The adapter will immediately reset.

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